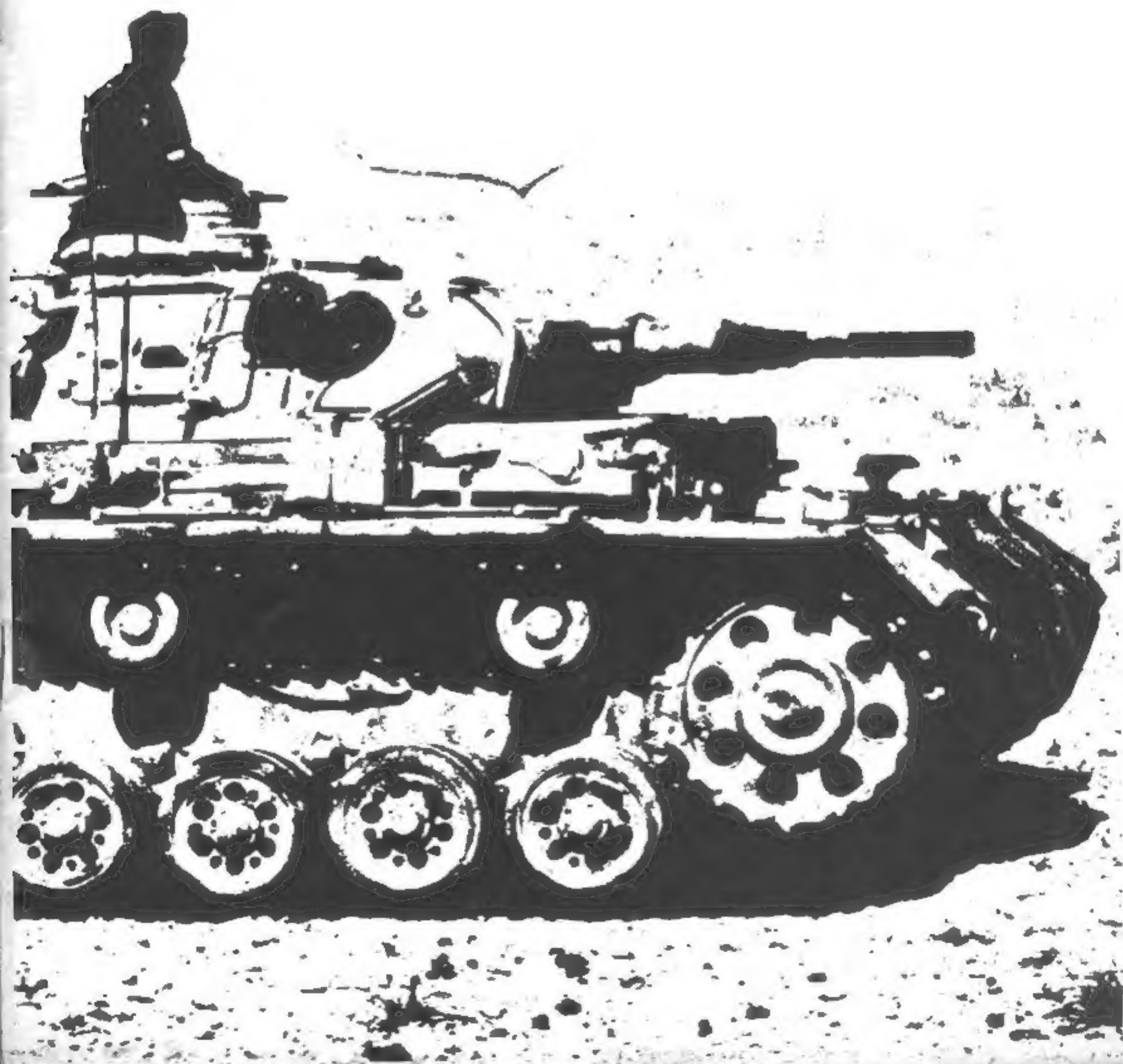


AFV

2

PANZERKAMPFWAGEN III

FIVE SHILLINGS





Panzer IIIs as far as the eye can see; an Ausf J with an H (left) leads a company of tanks forward during the victorious sweep into Russia, summer 1941. (Imp. War Mus.)

Panzerkampfwagen III

By Walter Spielberger

BY 1935, the tank-building industry in Germany had finally gained sufficient experience to incorporate ideas of its own in tank designs. The development of the Panzer I and II and the study of foreign tanks led to new ideas which turned out to be sometimes quite elaborate, complicated and costly. Consideration of the needs of mass production was generally neglected, for which mistake a high price had to be paid during later war years. General Guderian had initially envisaged two basic types to act as main equipment for the future German armoured force. The first vehicle was to be equipped with an armour piercing gun, in addition to two machine-guns, while the other type was to serve as a support vehicle, being equipped with a larger gun. The first one, later to become the Panzerkampfwagen III, was intended as the standard equipment for the three light companies of a tank battalion.

The selection of a suitable weapon caused some controversy between the Ordnance Department and the Inspector for Mechanized Troops. While *Waffenamt* (the Ordnance Department) seemed to be content with a 37 mm gun, the armoured troops demanded a gun of at least 5 cm calibre; however, since the infantry had already been equipped with the standard 37 mm anti-tank gun, this weapon also became the main armament for the Panzer III. Standardization and the fact that only one gun and its ammunition had to be procured, supported this decision. It was possible, however, to make the turret ring diameter big enough for subsequent up-gunning to 5 cm calibre without basic changes. Total weight was restricted to 24 metric tons to meet military bridging limitations inside

Germany. Top speed was to be 40 km per hour. The crew consisted of five men, with the commander, gunner and loader in the turret, and the driver and radio operator in the hull front. The commander had an elevated seat with a circular cupola mounted at the centre rear of the turret top. The tank commander communicated with the crew by intercom telephone using the same microphone and headsets employed with the vehicle's wireless. The commander, wireless operator and driver were all linked to the external wireless set. In the Model L onwards there was also a voice tube between the commander and gunner.

By the time of the invasion of Poland on September 1, 1939, however, the Panzer III was only in service in small numbers. At this time, the German Army had a total of five armoured divisions, all of which were engaged in the campaign. Supplemented by the Panzer-Lehr Regiment, the Ordnance Department's own testing unit, they were thrown against the poorly equipped Polish Army. With the added power of the German Air Force, this campaign was over within 18 days. The Polish Army fought bravely, but their forces proved to be completely inadequate. The campaign was the first full test of the German 'Blitzkrieg' tactics, close co-ordination in attack between dive-bombers and armoured forces. Though the Panzer III played only a minimal part in the invasion of Poland, the tactics evolved by General Guderian, in which the Panzer III was destined to figure more prominently later, were fully vindicated by the success of the campaign.

Preparation for the contemplated invasion of France brought a basic reorganization of the existing



First campaign involving the Panzer III, though only in relatively small numbers, was the invasion of Poland, September 1939. This is one of the Ausf D development models, distinguished by its front visor plate fittings (in this view), fording a river on the approach to Warsaw. Plain white cross was standard recognition mark for this campaign. (Chamberlain Collection.)

armoured force. The conversion of the three existing "Light Divisions" to 6th, 7th, 8th and 9th Panzer Divisions, planned before the war, was now carried out. Another armoured division, the 10th, newly-formed, concluded the reorganization. Only six of the Panzer Divisions, 1st, 2nd, 3rd, 4th, 5th and 10th, had an armoured brigade* with a full establishment of four battalions, equipped with German armour. Three Panzer Divisions (6th, 7th and 8th) had a tank brigade with three battalions only. These were equipped with captured Czech vehicles (Panzer 35(t)

*British terminology—German equivalent to the British 'Brigade' was called 'Regiment'.

A Panzer III Ausf F or G with the Afrika Korps in late 1941. It has the early cupola but re-spaced return rollers, plus the short 5 cm. gun. (Imp. War Mus.)



Panzer III Ausf E was the last model in the development series and had the torsion bar suspension adopted for all subsequent production models. Driver's visor cover and the machine-gun mount were also improved. This is an Ausf E in France, May 1940. It is evidently a vehicle brought from Poland since the cross shows evidence of being 'modified' from plain white. (Imp. War Mus.)

and 38(t)). The 9th Panzer Division in turn had only two battalions in its tank brigade, each equipped with German vehicles. A total of 349 Panzer III's, all mounting the 37 mm gun, were available at the beginning of the invasion of France and Flanders; they proved to be a decisive factor in German tank fortunes in this brilliantly conducted campaign.

Later, re-armed with a 50 mm gun, the Panzer III became the major equipment of German tank units





Panzer III Ausf H had the 5 cm. gun and extra armour plates on the hull front and superstructure front, clearly seen in this view – note the bolt-heads. Second vehicle is an up-gunned Model F. This scene is in Sofia, 1941. (Imp. War Mus.)

during the battles in the Balkans, in North Africa and in Russia. At a meeting of the Wehrmacht tank committee on July 17, 1941, the construction of 7,992 Panzer III vehicles was demanded for the contemplated future army establishment of 36 armoured divisions. By contrast, at that time total armoured fighting strength of the Wehrmacht totalled only about 4,000 vehicles. A production target of approximately 600 vehicles per month could be barely met. Output was supposed to be increased to 2,000 units per month, a task which was not finally achieved until



Panzer III Ausf E or F showing the 3.7 cm. gun, early type cupola with projecting bolts, and flush engine covers, all features of the early production models. (Axel Duckert.)

1944. Of special interest is a report describing events during a meeting with Hitler on November 29, 1941. Under the influence of the reverses on the Eastern Front, Hitler himself had obviously developed doubts as to the future of his armoured force. He called the Panzer III an inadequate design, since its main armament was insufficient for a vehicle of its weight. His quote, "the era of the tank might soon be over" reflects directly the tremendous shock created by the events in Russia. It should be emphasized, however, that the Panzer III, for its time, was a modern and technically advanced armoured vehicle. It would have been even more useful if Guderian's earlier demand for a heavier main armament had been accepted in the design stage. On September 27, 1939, the Panzer-kampfwagen III had been accepted as standard issue

Another Ausf H, lacking the retrospectively-fitted extra frontal armour, followed by another vehicle which has it, affording a contrast between the two in frontal appearance. These are 2nd Panzer Div. vehicles in Sofia, Bulgaria, May 1941. (Chamberlain Collection.)





Major distinguishing feature of Ausf J was the new ball mount for the hull machine gun and thicker armour. This is an early production vehicle with the 5 cm. L/42 gun – later vehicles had the long L/60 weapon. Note track shoes and sandbags used for extra frontal protection. (Imp. War Mus.)

and had received the nomenclature, "Sonderkraftfahrzeug 141" (usually abbreviated to Sd Kfz 141).

DEVELOPMENT HISTORY

Development orders for a vehicle in the 15-ton class were issued by the Ordnance Department during 1935, to be made by the firms of MAN (Nürnberg), Daimler-Benz AG. (Berlin-Mariensfelde), Rheinmetall-Borsig (Berlin), and Krupp AG (Essen). To maintain secrecy, the Germans used "concealed purpose" titles for their new generation of AFV designs. The new vehicle was called "Zugführerwagen" (ZW) or "troop commander's vehicle". Extensive trials of prototypes took place starting in 1936 and resulted in a production order for the Daimler-Benz design. The chassis design of this vehicle reflected clearly the influence of the automotive industry as represented by Daimler-Benz since it featured independent suspension and torsion bar springs as finally developed. Krupp by

Later production Model L had the longer L/60 5 cm. gun and the so-called 'spaced-armour' on superstructure and mantlet front. This is the well-known vehicle displayed at the RAC Tank Museum, Bovington, shown here to illustrate the framing for the spaced armour on the mantlet (the armour itself is missing) and the spaced armour in position on the superstructure front. (Warpics.)



Another view of an early Ausf J, clearly shows the wider spaced return rollers. (Warpics.)

contrast, with its vast background of locomotive construction, favoured the more traditional leafsprings and bogie wheel mountings. While Krupp's prototype, the "MKA" was not accepted for the 15-ton class tank, incidentally, many of the features of this vehicle were used in the Panzer IV for which Krupp's design was adopted. It is a remarkable fact that production orders for the new German tanks were placed with companies which did not necessarily have experience in automotive mass production. Obviously the need for production on a massive scale was not foreseen in 1936. Both of Germany's largest manufacturers, Opel and Ford, were bypassed because of their foreign affiliations. Later, however, Panzer III production was organized on mass-production lines.

PANZER III MODELS

The first Panzer III production model, "Ausführung A", was completed in 1936. Ten vehicles of this type, "1/ZW" (chassis numbers 60101-60110) were built, eight of them equipped with the 37 mm gun. The early models of the Panzer III Series were intended as development vehicles, and in the Ausführung A the

View of a Model L from the rear shows other late-model features including the new sprocket and idler wheels and the armoured louvres on the rear engine decking. Note also stowage box and spaced armour on mantlet and superstructure front, prominent even from the rear. (Chamberlain Collection.)



suspension consisted of five large road wheels supported by coil springs. Front sprocket drive and rear idler wheels, together with two return rollers, completed the running gear. Armour 5 to 14.5 mm thick gave the vehicle a total weight of 15.4 metric tons. A Maybach "HL 108 TR" 12 cylinder gasoline (petrol) engine gave it a top speed of 32 km per hour (20 m.p.h.). Basic hull, turret, and superstructure remained unchanged throughout the Panzer III production life.

The second model in the series, Ausführung B, appeared in 1937. The only basic change was effected in the chassis design. Eight bogie wheels per side were now provided, two bogies each supported by one large horizontal leafspring. The number of return rollers was increased to three. Fifteen vehicles were produced (chassis numbers 60201-60215). Armour thickness was still 14.5 mm. The third model, the Ausführung C (chassis numbers 60301-60315) appeared at about the same time. Again, a total of 15 vehicles was produced. The Ausführung C differed from the B only by a modification to the suspension. Extra leafsprings each side were added bringing the number to four, allowing for an individual suspension of each bogie. The fourth development was the Ausführung D (Type 3b/ZW). The basic armour was increased to 30 mm, bringing the total weight to 19.8 metric tons. The suspension was almost identical to the Ausführung C, with the smaller leafsprings now arranged in an angle. Instead of the previous five-speed gearbox, a six-speed ZF transmission was



Above: Ausf M had all the visible external features of the L but the pistol ports in the turret side were omitted as were the hull side escape hatches. Another prominent feature were the triple 90 mm. Nb.Kwg. smoke dischargers on the turret sides, replacing the tail smoke dischargers. (Chamberlain Collection.)

Below: Another Model M this time fitted with full skirt armour for hull and turret, a 1943 feature. (Chamberlain Collection.)



Above: Model N had the short L/24 75 mm. gun from the Panzer IV, and appeared in late 1942 and 1943 for the 'close support' role. It was sometimes called Sturmpanzer III. This is one of the Model Ns converted from a Model L. Others were built as Ns. (Imp. War Mus.)



In 1942 a total of 100 Panzer III Ausf M were converted to Flammenwerfer-Panzer III by replacing the 5 cm. long gun with a flame projector which resembled the gun barrel except for lack of taper. 1000 litres of flame fuel were carried in the hull in containers which replaced the ammunition racks, and on one loading 70-80 shots were possible. Range was 55-60 metres. Note the triple smoke dischargers on turret side. (Chamberlain Collection.)

installed (chassis numbers Ausführung D, 60221-60225 and 60316-60340).

Basic changes were incorporated with the introduction of the next model, the Ausführung E, which was the last of the development models. Built from 1939 until 1940, its Daimler-Benz designation was "ZW 38", its type "4/ZW" (chassis numbers 60401-60441). This vehicle had a new engine (Maybach HL 120 TR) and a new transmission (Maybach Variorex). The most drastic change, however, was reflected in the suspension system, which now incorporated transverse torsion bars with independent road wheels. This basic suspension remained in production, virtually unchanged, until the end of the entire model run. Though this system appears symmetrical, it was, in fact, offset by about five inches to allow the torsion bars to fit between each other. Detail changes on this model included an improved driver's visor and hull machine-gun mount.

By 1938 the Ordnance Department had themselves realised the error of insisting on a 37 mm gun for the Panzer III. They now authorized development of an up-gunned version. Krupp of Essen were asked to develop the turret and a 5 cm gun was specified, as first requested in vain by General Guderian in 1936.

The new gun mount was not ready, however, by the time the first major production version of the Panzer III, the Ausführung F (Type 5/ZW) appeared



The Pz.Bef.Wg III (armoured observation post) had a dummy wooden gun barrel and a central ball-mounted machine gun in the mantlet to serve observation officers for motorized artillery units. This one is based on a Panzer III Ausf. H. Turret was fixed. (Imp War Mus.)

in early 1940. This still had the 37 mm gun. Chassis, superstructure and turret remained unchanged and only improved ventilators on the turret distinguished it from the Ausführung E. Both models E and F and even early production Ausführung G's were fitted with the standard 37 mm gun, but starting late in 1940, they were all converted to take the 5 cm KwK L/42. This was against the wish of a determined Hitler, who immediately had demanded the fitting of the longer and more powerful L/60 5 cm gun.

The Panzer III Ausführung F had a modified version of the Maybach power-plant, the 12 cylinder "HL 120 TRM", of 300 h.p. Standard fitting on this model in the light of combat experience was a rack of five smoke generators on the hull remotely released by a rod from the turret. A stowage box was added to the rear of the turret in some vehicles. F series chassis numbers were 61001-65000.

The seventh model, the Ausführung G, appeared also in 1940, all except the very earliest already equipped with the 50 mm gun. The turret had a new commander's cupola with narrow twin covers that moved apart from each other instead of sliding shutters over its five vision ports and thicker armour. Vehicles destined for Africa received in production (or retrospectively) additional air filters and a different cooling fan reduction ratio. These were designated Ausführung G (Tp)*. A new driver's visor was fitted with a single shutter to offer better protection against "splash".

*Tp: Tropical.

Front view of a Panzerbefehlswagen III Ausf. D (at first designated Pz.Bef.Wg Ausf. A) converted from one of the old Model D development tanks. Note the old leaf spring suspension, the old type cupola, and the frame antenna on the rear deck which distinguished command tanks. (Chamberlain Collection.)



Another Pz.Bef.Wg III, this time with armoured side skirts for turret and hull, Russian Front 1943. The early pattern cupola and superstructure front indicate that it is converted from a Model E or F. (Axel Duckert.)

Total Ausführung G production was 450, chassis numbers 65001-66000.

The appearance of the Panzer III, Ausführung H at the very end of 1940 brought a major change in the suspension system. The track width was increased from 360 mm to 400 mm. New final drive and idler wheels were used and the spacing of the return rollers was increased to give better support to the heavier track. New sprockets and idlers of simplified pattern were used and less complicated manual transmission was installed. Experience gained during previous battles resulted in a demand to increase the relatively thin armour of the Panzer III. As an interim solution, Ausführung H vehicles leaving the production lines in 1941 came equipped with additional 30 mm armour plates attached to the front faces of both hull and superstructure. The Ausführung H remained in production for the early part of 1941. Some vehicles of this type were later refitted with the longer L/60 50 mm gun. Chassis numbers of the H series were 66001-68000.

The first batch of the next version, the Ausführung J, (chassis numbers 68001-69100) were still equipped

A Pz.Bef.Wg III Ausf. E (originally called Pz.Bef.Wg III Ausf. B) converted from a Panzer III Ausf. E. Note rack for tail smoke dischargers and the frame antenna. (Chamberlain Collection.)



with the short-barrelled 5 cm gun. The basic armour, however, was increased from 30 mm to 50 mm. This necessitated a further change in the driver's visor and the ball mount for the radio operator's machine-gun. From vehicle 72001, the new 5 cm KwK 30 L/60 was used and was fitted in all future production vehicles until the end of the run of the Ausführung J version which terminated at chassis 74100. These later models had the right turret-front vision slot and the side vision slot omitted. With the long-barrelled gun, ammunition stowage was reduced from 99 to 84 rounds. These vehicles were built throughout 1941.

The Panzer Ausführung L was externally almost identical to its predecessor. However, a major change was the subsequent addition of a torsion bar compensator in the suspension to balance the nose-heaviness induced by the fitting of the 5 cm guns, plus the extra weight of the additional "spaced armour" now fitted over the superstructure and mantlet front. Coil springs were found insufficient to counteract the added weight. Only 78 rounds of ammunition were carried. With chassis numbers 74101-76000, Ausführung L was in production until 1942.

Also in 1942 the Ausführung M appeared, simplified by elimination of the vision slits and the hull escape door openings. With the introduction of skirting armour, some of these openings had become superfluous, and in any event, there was a continual quest for reducing production time. Some of the Ausführung M vehicles had a deep wading kit installed, allowing them to ford streams up to a depth of 4½ ft. Chassis numbers were in the range from 76001 to 78000.

The final version of the Panzer III, the Ausführung N came off the production line towards the end of 1942. It was simply a continuation of the Model M, equipped with the short-barrelled 75 mm gun, the previous main armament of the Panzer IV. Six hundred and sixty-six of these vehicles were manufactured when the production of the Panzer III was terminated in August 1943, and its production



Rare view of a Pz.Bef.Wg III Ausf H (formerly Ausf C) in service, with 9 metre aerial erected. (Axel Duckert.)

capacity given over to Sturmgeschütz III (Stug III) vehicles. Some Model L's were later refitted with the short KwK L/24 75 mm gun and re-designated Model (Ausführung) N accordingly. There was also a tropical version of the Ausführung L with the same modified fittings as the Ausführung G (Tp).

To conclude the Panzer III development story, a vehicle has to be mentioned which was intended to replace it. Developed by Daimler-Benz, its designation was "Panzerkampfwagen VK. 2001 (DB)". Daimler-Benz called it "ZW 40" in their production records. Two prototypes were built and thoroughly tested during 1939/1940. Equipped with a Daimler-Benz diesel engine, this 22-ton vehicle developed a top speed of 50 km/h. Leafspring suspension and various trans-

A Pz.Bef.Wg III Ausf E leading a company of Panzer II tanks during the invasion of France in May-June 1940. Note the extra aerials. (Imp. War Mus.)





A Panzer III Ausf G of the Afrika Korps. Note the excellent accessibility provided by the turret side doors, and the characteristic pile of stores on the hull rear. (Imp. War Mus.)

mission layouts characterized this development which was finally dropped in favour of heavier vehicles.

PRODUCTION

Since the Panzer III was intended to become the major equipment of the German tank force, ambitious production goals were immediately established. To cope with this production, several manufacturers received contracts. By 1939, the following companies were engaged in the manufacturing of "ZW" (i.e., Panzerkampfwagen III) vehicles:

Altmärkische Kettenfabrik GmbH (ALKETT) (Spandau works for assembly and Falkensee works for chassis construction)

Daimler-Benz AG (Berlin-Mariensfelde)

Fahrzeug-und Motorenbau GmbH (FAMO) (Breslau)

Henschel & Sohn AG (Mittelfeld-Kassel, No. 111 plant)



A Pz.Bef.Wg III fords a river during the initial stages of the invasion of Russia in 1941. Note the frame aerial, spare wheels, and tail smoke dischargers in a rack on the right rear. (Imp. War Mus.)

Maschinenfabrik Augsburg-Nürnberg AG (Nürnberg)

Mühlenbau-und Industrie AG (MIAG) (Amme Braunschweig)

Waggonfabrik Wegmann AG (Kassel)

Maschinenfabrik Niedersachsen-Hannover (MNH) (Hannover-Linden)

Of all the manufacturers mentioned, Alkett produced the majority of Panzer III vehicles. Wegmann were engaged from 1937 to 1942. Henschel assembled most of its Panzer III output from 1939 to 1940. MIAG, starting late, completed approximately 1100 vehicles from 1941 to 1943. MNH's production goal

A British Universal Carrier passes a still burning Panzer III Ausf G which had been knocked out in the Alamein fighting, October 1942.



was 30 vehicles a month, while Daimler-Benz and FAMO both contributed 26 per month.

Most of the hulls, superstructures and turrets were supplied by Deutsche Edelstahlwerke AG. of Hannover. The main armament came from Karges-Hammer of Braunschweig and Franz Gorny, Frankfurt. From November, 1940, a monthly production target of 108 vehicles per month was established; it was not always reached. In 1940 and 1941 total production reached 2,143 "ZW" vehicles, 1,924 of which were equipped with the 5 cm gun. Available to the armoured forces in July, 1941, were 327 Panzer III's with the 37 mm gun and 1,174 with the 50 mm armament. By April 1, 1942, the total of 37 mm armed vehicles was reduced to 131, while the 5 cm vehicles had been increased to 1,893. Total production figures for 5 cm L/60 armed Panzer III's were 40 in 1941, 1,907 in 1942, and 22 in 1943. A grand total of 5,644 Panzer III tanks was reached. The raw material consumption of a Panzer III was: Steel 39,000.00 kg. Tin 1.40 kg. Copper 60.10 kg. Aluminium 90.40 kg. Lead 71.10 kg. Zinc 49.10 kg. Rubber 125.00 kg.

For ease of production the Panzer III was divided into four pre-fabricated sub-assemblies—hull, turret, and front and rear superstructure. Most of the fittings were standardized with the Panzer IV. The use of sophisticated plant for pre-fabrication and assembly greatly speeded up production, even though mass-production was not foremost in the mind of the Ordnance Department when the Panzer III was first designed.

THE PANZER III DESCRIBED

The Panzer III hull, as stated above, consisted of three separate sub-assemblies, namely the main hull, the

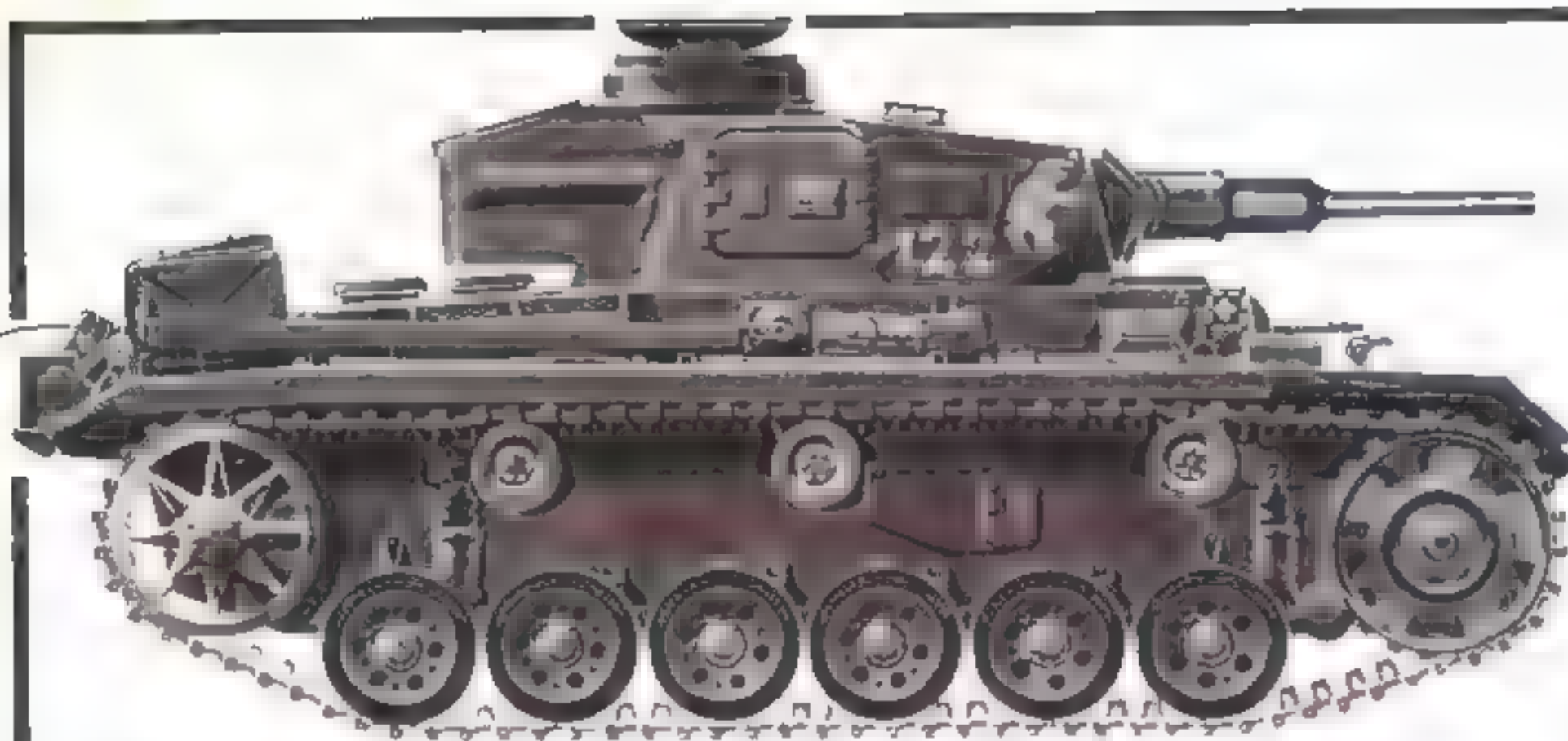


Close up of a Panzer III Ausf F on the Russian Front, September 1941 shows the early type of cupola with prominent bolt heads and sliding shutters. (Imp. War Mus.)

front superstructure carrying the turret and the rear superstructure, covering the engine compartment. All these units were of single skin welded construction and the individual assemblies were bolted together. The hull section was divided into two compartments by means of a bulkhead; the front one housed the gear-box and steering mechanism. The driver's vision block was secured through an adjustable slot in the front plate of the superstructure. This plate also supported the ball-mounted machine-gun which was manned by the radio operator. Sideways vision for these two crew members was through visor blocks, protected by armoured flaps, mounted in the side-plate of the superstructure. Hinged escape doors were centrally located on both sides of the hull, though these were eliminated from the Model M. The top front plate of the main hull had hinged doors, giving access to the brake mechanism and providing means of escape for

Panzer IIIs of Panzer Group South cross the Dan river during the advance on Stalingrad, summer 1942. Note the German national flag, commonly used as an aerial recognition sign. (Imp. War Mus.)





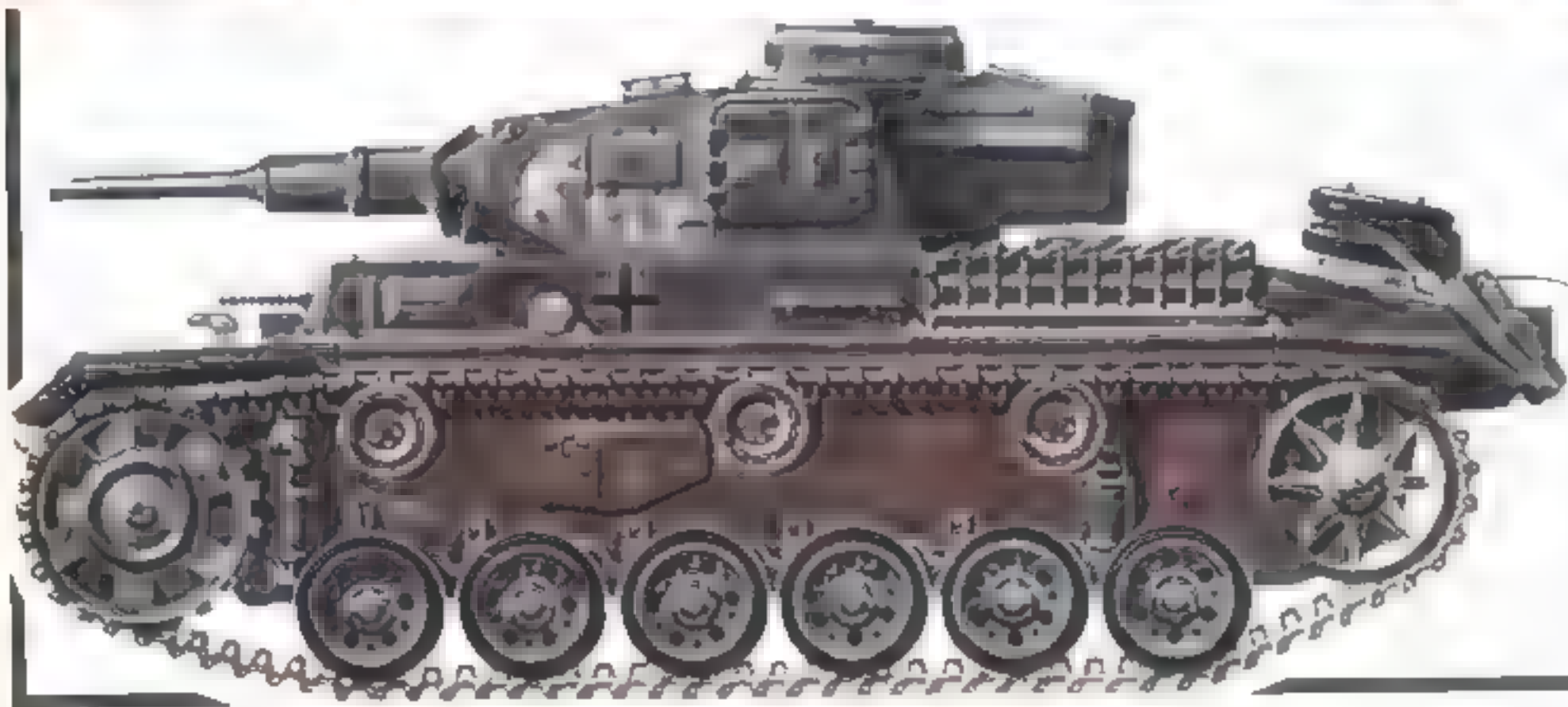
Panzer III. Ausf J. of the 3rd Panzer Division. Russian Front, 1941

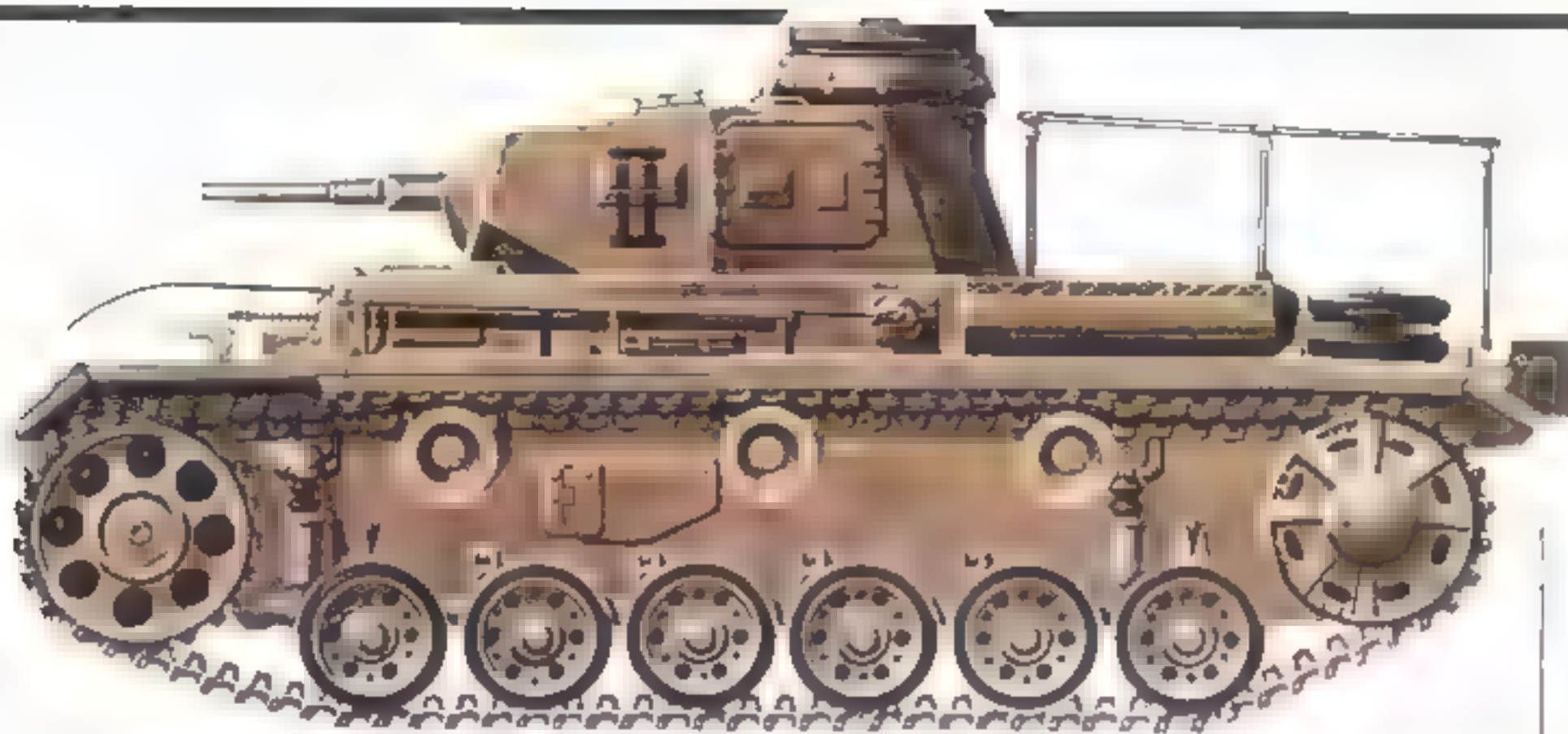


A



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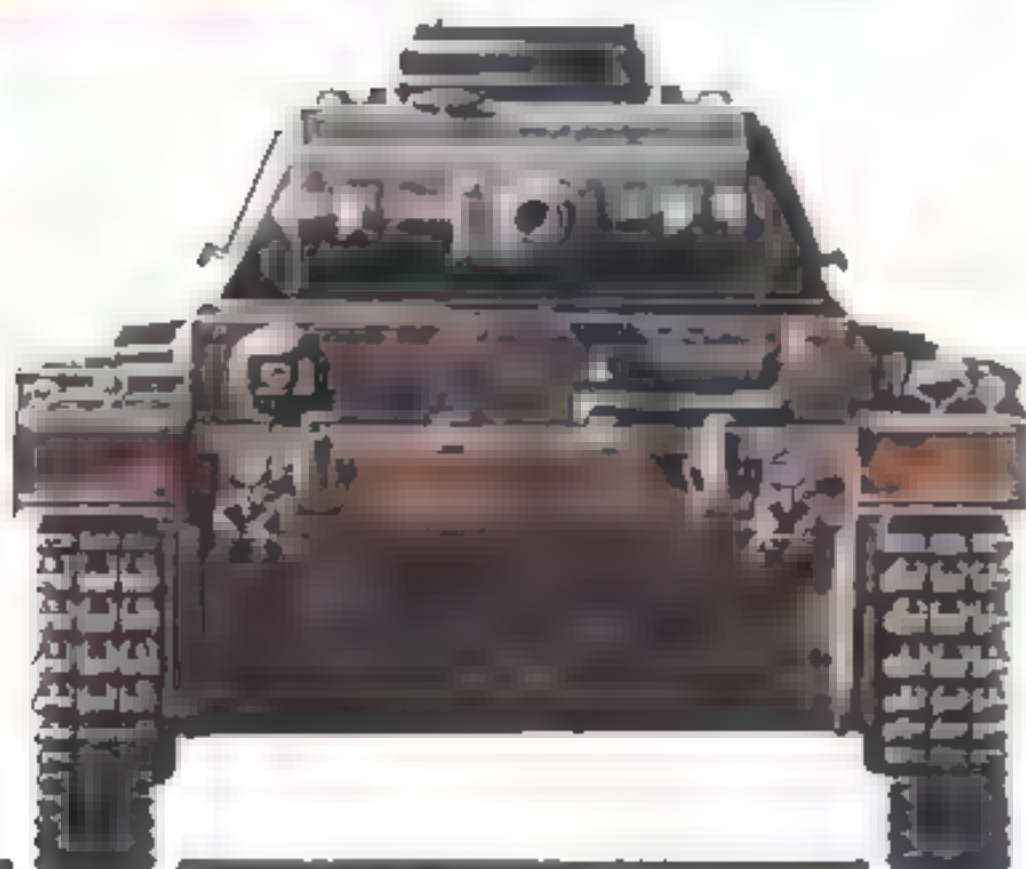
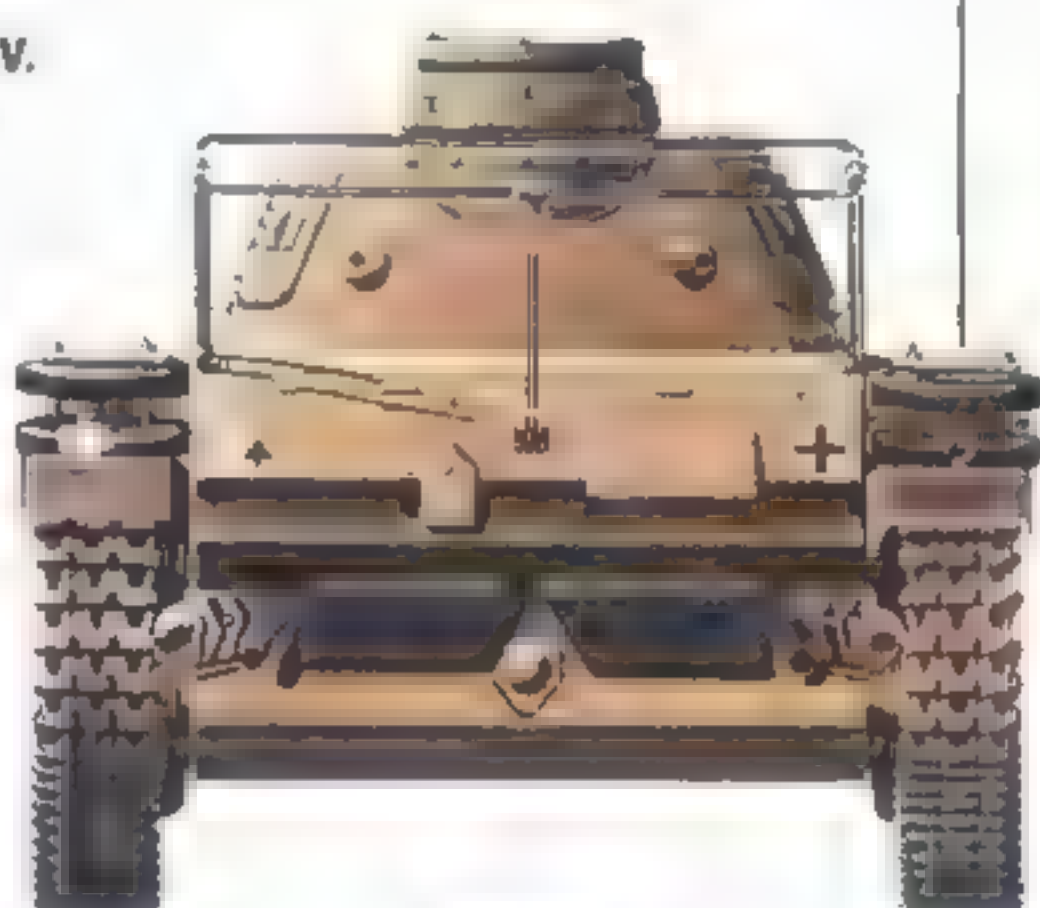
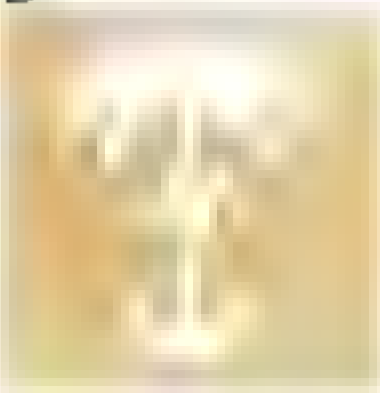
Panzer III. Ausf E. of the 15th Panzer Division, Afrika Korps, 1942.
Battalion HQ vehicle.

B



- A. Bear emblem of 3rd Pz Div.
- B. Alternative style seen on some vehicles.
- C. Tactical marking of 3rd Pz Div.
- D. Insignia of the Afrika Korps.

D



the crew. All armour plates were made of high quality chromium-molybdenum steel.

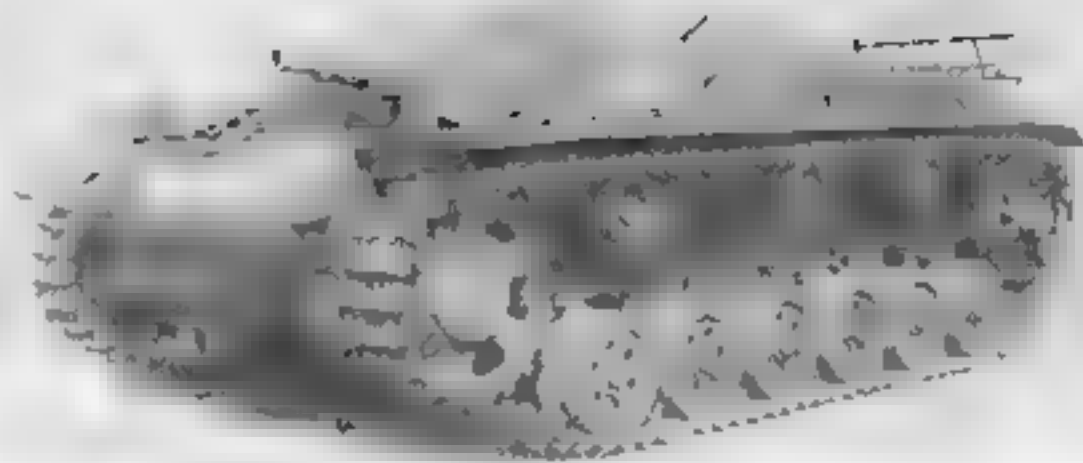
The welded turret, similar to that of the Panzer IV, provided space for the other three crew members, namely the commander, the gunner and the loader. No rotating platform was provided, but the commander and the gunner had their seats suspended from the turret and thus traversed with it. The turret of Models H-M were fitted with a 50 mm cannon and one machine-gun which was mounted co-axial with the main armament. There were large hinged double doors on the turret sides, equipped with vision slots, and pistol ports provided for easy accessibility.

Additional observation ports were provided in each sidewall of the turret, together with two ports in the mantlet front. All well protected by armoured flaps. The 50 mm gun had an external mantlet, though the 37 mm gun of the early models was attached to an internal shield. The rear plate of the turret had two circular pistol ports. The turret roof itself provided openings for ventilators, signal ports, and the circular commander's cupola. Mounted centrally at the rear of the roof, it had five observation ports, equally spaced around its circumference; it was closed by a pair of semi-circular hatch covers. In early development models the cupola was of the "dustbin" type, and in models E and F it had armoured walls with projecting bolts. From Model G on a squatter type of cupola was fitted which had thicker (50-95 mm) armour and improved shutters.

The main armament of Models E-J was the 5 cm Kampfwagenkanone (KwK) L/42 with a barrel length of 2,103 mm. No muzzle brake was provided. Its maximum muzzle velocity with supercharge APC ammunition was 685 metres per second. It was capable of penetrating homogeneous armour of 47 mm thickness at a distance of 500 yards. The following different kinds of ammunition could be carried:

The first was the explosive loaded (supercharge) armour-piercing capped projectile previously mentioned. This was designated "Panzergranate 39". The second type was the "Panzergranate 40", which was a light-weight projectile with a tungsten carbide core. This ammunition, also called armour-piercing com-

A Panzer III Ausf F passes a Soviet KV1 tank it has just knocked out in the advance in the Ukraine, summer 1941. 'K' indicates that the vehicle is from Von Kleist's Panzer Group. (Imp. War Mus.)

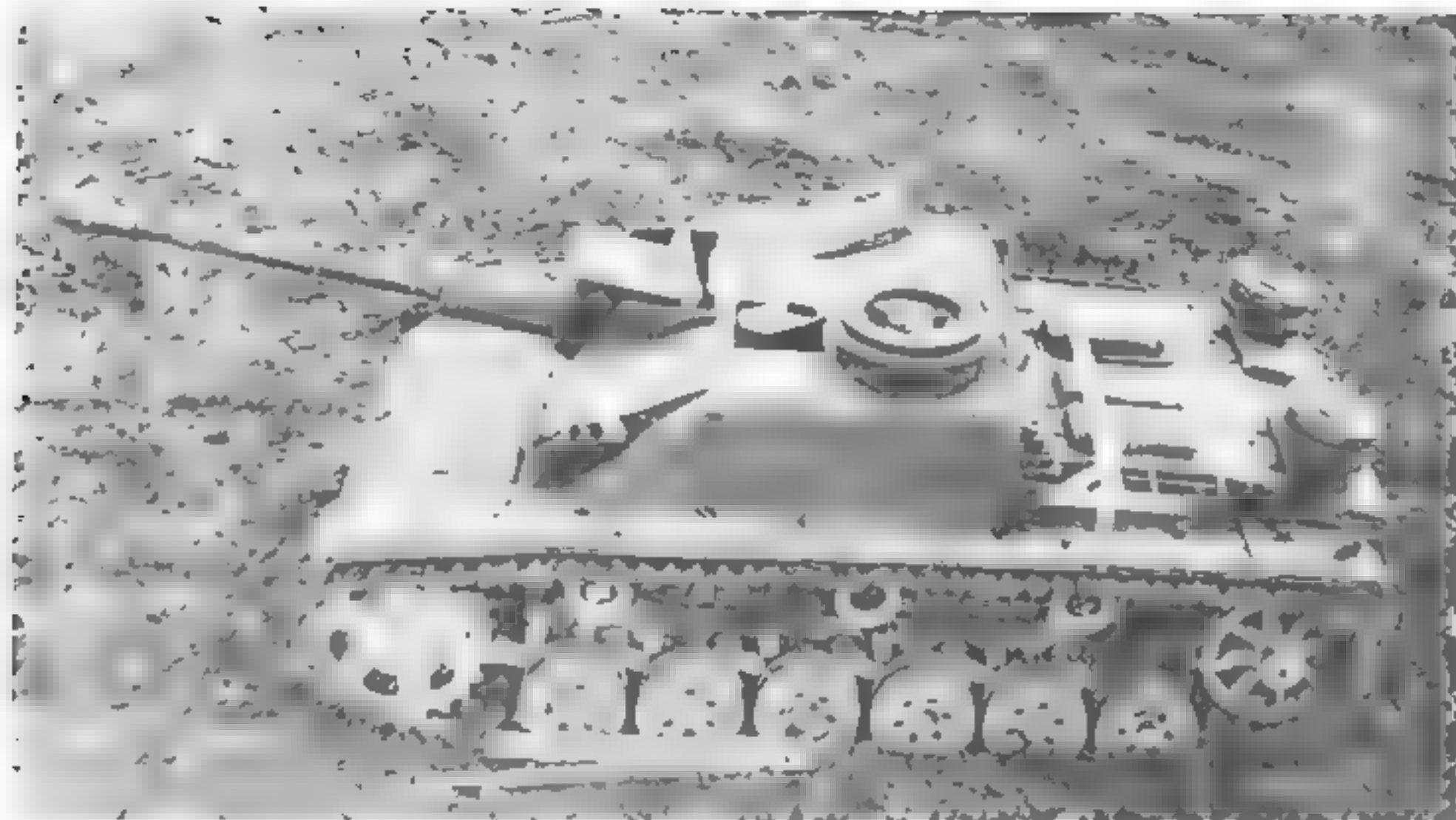


Most important development on the Panzer III chassis was the Sturmgeschütz III (StuG III) which had the short 75 mm L/24 gun in a limited traverse mount, originally based on the F chassis. This is a later production vehicle, the Ausf C. (Imp. War Mus.)

posite rigid, achieved a high muzzle velocity because of its light weight. However, this velocity and hence the penetration, decreased rapidly with increasing range, and it was less effective than APC over about 700 yards. At 100 yards however, its penetration was 97 mm compared to 55 mm for APC. The third type of ammunition carried was "Sprenggranate 38", or high explosive, for use against anti-tank guns and lightly-armoured vehicles. A total of 99 rounds of ammunition was provided in models with the L/42 gun, plus 2,700 rounds for the two MG 34 machine-guns. Turret traverse of 360° was by hand wheels, and elevation limits were -10° to +10°.

Another view, of a StuG III Ausf C with short 75 mm. gun, shows how the conversion was simply made on the basic Panzer III design by producing a completely new superstructure. Hull sub-assemblies did not require changing. Projection on left of superstructure (right) housed radio equipment. (Imp. War Mus.)





From 1942 the Sturmgewehr III had the power plant of 38.75 mm gun. This official recognition shot shows the Ausf. G model tank destroyer with machine gun shield, 100 mm main gun, 30 mm anti-air gun, 20 mm anti-tank gun, and imposed superstructure with one turret 30 mm anti-air gun. (US Signal Corps.)

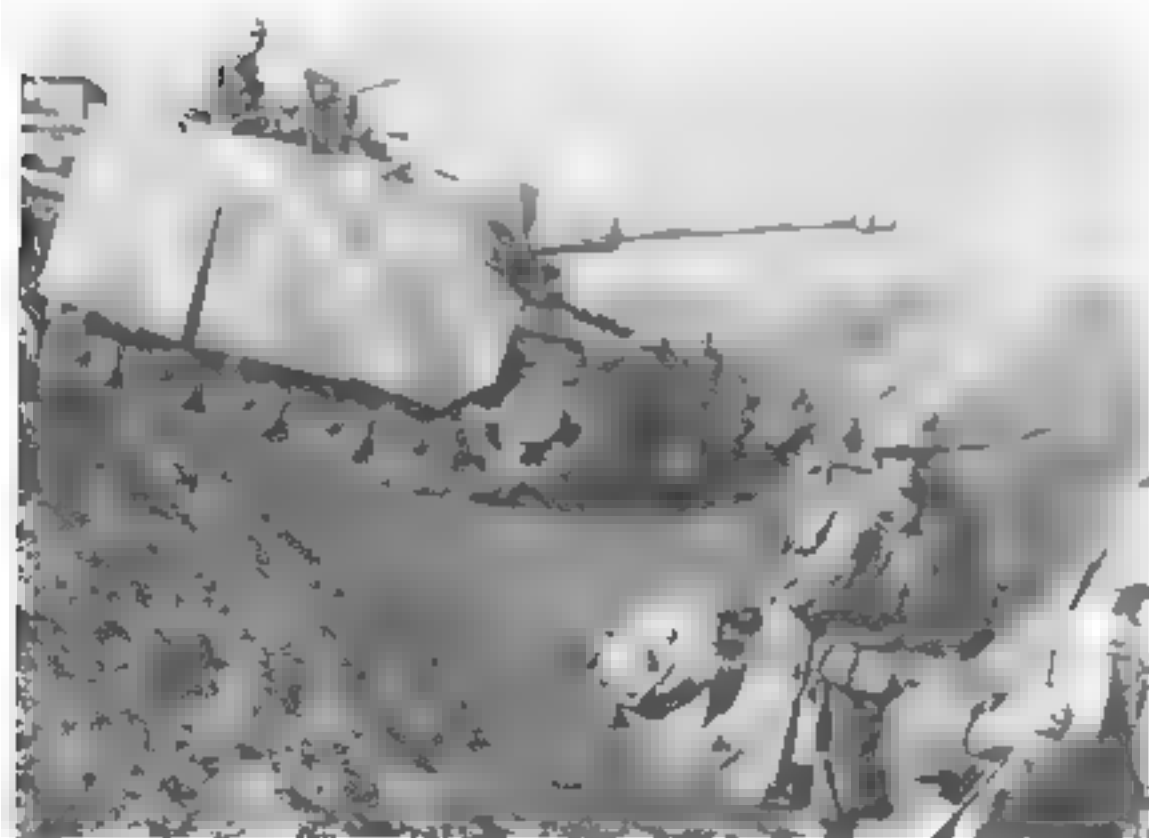
The main power plant, the HL 120 TRM in Model F onwards, was built by Maybach, and under licence by other manufacturers. It was a 12 cylinder "V", four-stroke gasoline petrol engine with a maximum output of 300 b.h.p. Cooling air entered through louvres in the front of the rear superstructure and also through wire mesh grids on the sides and passed over the engine to the two radiators placed one on either side of the engine compartment. The fans for the radiators were driven by long twin belts from a pulley mounted on an eccentric spindle. The pulley

was coupled to the engine by a short universal joint shaft. Four oil bath air cleaners were mounted parallel to a manifold attached to the top face of the carburettors.

Power from the engine was transmitted via a swaged tubular cardan shaft. The clutch was situated in a casing mounted at the rear of the gearbox and transmitted the drive through various gears to the steering mechanism and final drive. Control of the transmission was effected through a vacuum-operated selector and gear change system, coupled with a hydraulically-operated gear synchromesh clutch. Gear selection was made by the hand pre-selector lever which in turn set cams to a pre-determined combination in a vacuum distribution box. To complete the gear change, the clutch pedal had to be depressed, this pedal was coupled to a hydraulic valve controlling the clutch and a vacuum valve to energize the distribution box. For engaging forward, neutral or reverse, a hand direction lever was provided, but once this lever had been set to forward, each of the ten forward speeds selected according to road conditions, could be engaged without further action. Speeds 1, 2, 3, and 4 were available only for reverse; however, only one reverse gear was commonly used. The Maybach "Variorex" 10-speed gearbox comprised four sets of constant mesh helical gears and one set of constant mesh spur gears mounted individually in line and on short shafts and roller bearings. The changes in ratio were effected through sliding dog clutches. Disengagement of the drive was by means of a multi-plate clutch on the primary shaft.

The steering mechanism was mounted at the front end of the gearbox forming an integral unit. The final drive and track brake were attached to the hull side plates. Very short propeller shafts connected these units. Output from the gearbox was transmitted to a

A StuG III Ausf. G negotiates an anti-tank ditch on the Orel Front, Russia, in support of advancing infantry. Note the machine-gun and shield, and the commander's binocular sight raised in the cupola. Skirt armour was a usual fitting by this period, July 1943. (Imp. War Mus.)





One in every nine StuG IIIs from 1942 onwards had the 10.5 cm howitzer (and were classified 'Sturmhaubitze'). Otherwise they were identical to the StuG III Ausf G with the 75 mm gun. This vehicle is shown in Northern Italy in July 1944. It is typical of very late StuG IIIs with Zimmerit anti-magnetic paste covering, clearly visible. (Imp. War Mus.)

transverse shaft by means of spiral bevel gears, this shaft, in turn, driving the annulus of an epicyclic gear situated at either end. The outer wheel of this gear was extended outside the casing and carried the clutch brake drum. The drive itself continued via the planet wheel carrier to the final drive, which consisted of heavy spur gears. The Daimler-Benz/Wilson clutch braking system was operated hydraulically. Both right and left hand tracks were controlled independently by identical hydraulic systems, consisting of a steering control unit, a telescopic cylinder operating the clutch brake, and another one operating the track brake.

A total of 93 links, similar to the ones used on the Panzer IV, were needed to complete one track. Made of manganese steel and of the "skeleton" type, they were 360 mm wide. The track tensioning device was a robust ball crank lever to which was mounted the tensioning wheel. The lever, mounted on the rear portion of the hull side, was operated by a large diameter draw screw. The six independent road wheels per side were suspended by torsion bars. To allow these torsion bars to extend the full width of the hull, the corresponding right and left hand road wheels were staggered as previously noted, the anchor bracket on each side being constructed in one piece to form a housing for the suspension arm bearing and a location for the inner end of the opposite road wheel torsion bar. The four front and four rear torsion bars were larger in diameter than the four centre members. This was done to prevent undue pitching of the vehicle. In

addition, shock absorbers were fitted to the front and rear road wheels. Attached to the outer end of each torsion bar was a suspension arm, made of an alloy steel forging. The road wheel was mounted at its extremity on two substantial roller bearings. The road wheels were fabricated with the tyres vulcanized to the outer rim.

Electrical equipment consisted of a 600 watt Bosch GTLN generator, with a maximum output of 70 amps. Two starters were used, one the Bosch BNG 4 24 electric starter, and the other an AL ZMA R 4 hand-operated inertia starter. Two batteries were carried.

MARKS AND HYBRIDS

For the invasion of England (Operation Sea Lion), expected in 1940, a special amphibious tank battalion, called "Panzerabteilung A", was assembled in Putlos in northern Germany. Between September and October, 1940, two additional battalions were formed, named "Abteilung B" and "C". All the Panzer III and IV tanks in these units were made submersible. All existing openings on the vehicles were closed and sealed, and the air intake for the engine was completely eliminated. A rubber tube was inserted between the turret and superstructure, and rubber covers were placed over the main armament, the gun mounts and

the commander's cupola to keep these assemblies water-tight. A detonator fuse, imbedded in these covers and activated after the vehicle had emerged from the water, was supposed to blow off the rubber shrouds and make the vehicles battle-ready. Fresh air supply was secured by means of a flexible tube 18 m long with a diameter of approximately 20 cm. It ended in a buoy to which a radio antenna was fitted.

The exhaust silencers were equipped with high pressure valves to keep water out. When submerged, seawater was used to cool the power plant. The diving depth was up to 15 m. Mode of operation was to submerge the vehicles from the landing craft before the English coast was reached. They were to land on the beaches by simply driving under water on the seabed to the shoreline. Extensive trials proved this theory to be feasible under actual conditions, but Operation Sea Lion never materialized. The vehicles, together with amphibious Panzer II's, later formed the 18th Panzer Regiment of 18th Panzer Division. They were used at the beginning of the Russian campaign to cross the River Bug in 1941.

For commanders of large armoured formations there was a special version of the Panzer III. As early as 1938, some Panzer III Ausführung D's had been adapted to make the so-called "Panzerbefehlswagen" (armoured command vehicle). Three different models, differentiated only by their radio equipment, were converted and designated Sd. Kfz. 266, 267/268 respectively. They were almost identical in appearance to the standard model but their five-man crews consisted of the commander, adjutant, driver and two radio operators. The turret was fixed in position and a dummy gun barrel replaced the main armament. Two whip aerials (1.4 m and 2 m long), one retractable radio mast (9 m long) and the usual frame antenna mounted above the engine compartment completed the special equipment. The space left in the turret by

removal of the gun was utilized for map tables and the additional radio equipment. This vehicle was at first designated Panzerbefehlswagen Ausführung A. A few vehicles similarly converted from Panzer III Ausführung E's were originally designated Panzerbefehlswagen III Ausführung B, later E.

A modified version of the command vehicle was produced in 1940 based on the Panzer III Ausführung E. Chassis numbers were in the range 60501 to 60545. Production was completed in March, 1940. In November, 1940, a new version, the Panzerbefehlswagen III Ausführung H, appeared originally designated Ausführung C. The lack of a suitable main armament caused some concern, and the final vehicles of this type, the Panzerbefehlswagen III Ausführung K, were ordered from Daimler-Benz in January, 1941, with the 5 cm gun in a rotating turret. Only additional radio equipment distinguished these vehicles from the standard tank. Production of this later Panzerbefehlswagen continued until August, 1943. Totals of Panzerbefehlswagen III vehicles available for service at various times were as follows: July 1, 1941, 331, April 1, 1942, 273.

As an observation post vehicle for armoured artillery units, the "Panzerbeobachtungswagen III" (Pz Beob Wg III) was produced. This was originally considered only as an interim type until the specialized VK. 903 OP vehicle was ready. Equipped with substantial communication gear, the Pz Beob Wg III handled communication and fire direction between artillery units and served in this function until the end of the war. The VK. 903 in fact never materialized. Utilized for this conversion were mainly older chassis of the Panzer III Ausführung E, F and G series; the main armament was removed and a machine-gun substituted.

The Panzer III Ausführung F (5 ZW) also formed the basis for the production models of the "Sturm-

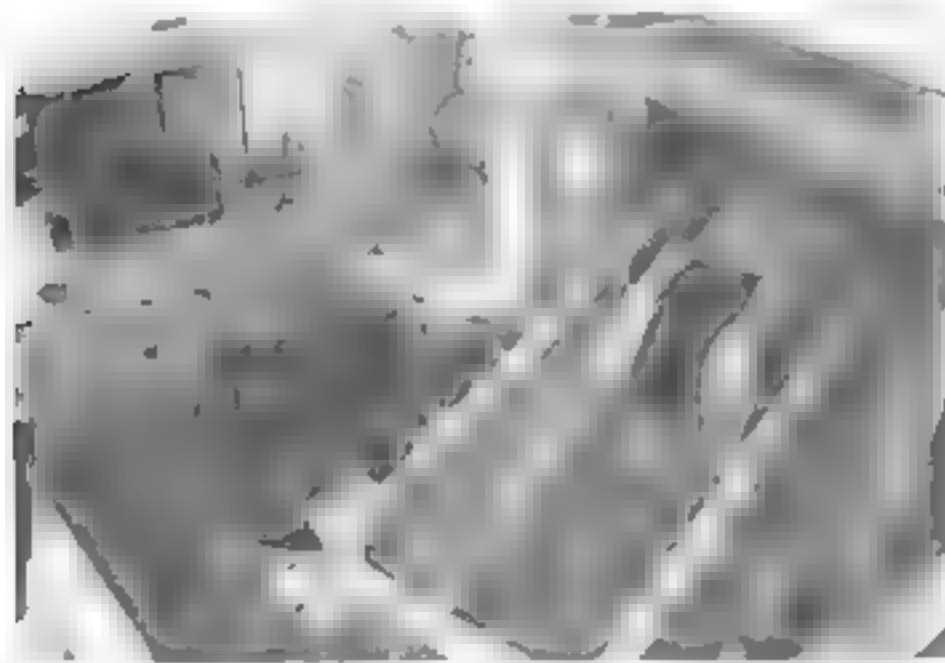
A late model StuG III Ausf G at the Finnish Army Museum with its side cut away to show interior layout and crew positions. This also gives an excellent view of the Panzer III torsion bar suspension. (Chamberlain Collection.)



EMPLOYMENT

The political situation in Germany after 1933 when the National Socialists came to power led to much increased support for the original 10,000 man army of the former Weimar republic. An ambitious reorganization plan envisaged the conversion of most cavalry units to armoured or motorized battalions. In the meantime the basis for the Panzertruppe had been established and its nucleus created. The infantry, not content with a secondary role, also demanded motorized formations. To control these various trends, Hitler insisted on one command for all "Schnelle Truppen", and this wish was realized on November 24, 1938. Due to bureaucratic delays, however, the new command was not set up until September 19, 1939, when Germany was already at war. By this time the German armoured forces had already proved to the world that their concept of "Blitzkrieg" tactics could be realized. Within the armoured divisions, purpose-built vehicles played an important role, most important being the Panzer III, available only in limited numbers but bearing the distinctive stamp of its creator, General Guderian. Since most of the tank fighting in Poland was done by its smaller counterparts, the Panzer I and II, the Panzer III was relegated to a supporting role, by virtue of the limited numbers available. The basic concept, however, was tested and found acceptable. Together with the captured Czech equipment, it proved much more important in France, in 1940. Improved tactics within sound strategic thinking made it the major equipment during the 1941 campaigns against Yugoslavia and Greece. Now equipping three out of four German tank companies, it fought all the major battles during the following

Above: Driver's seat and steering controls, each lever controls steering of trucks.

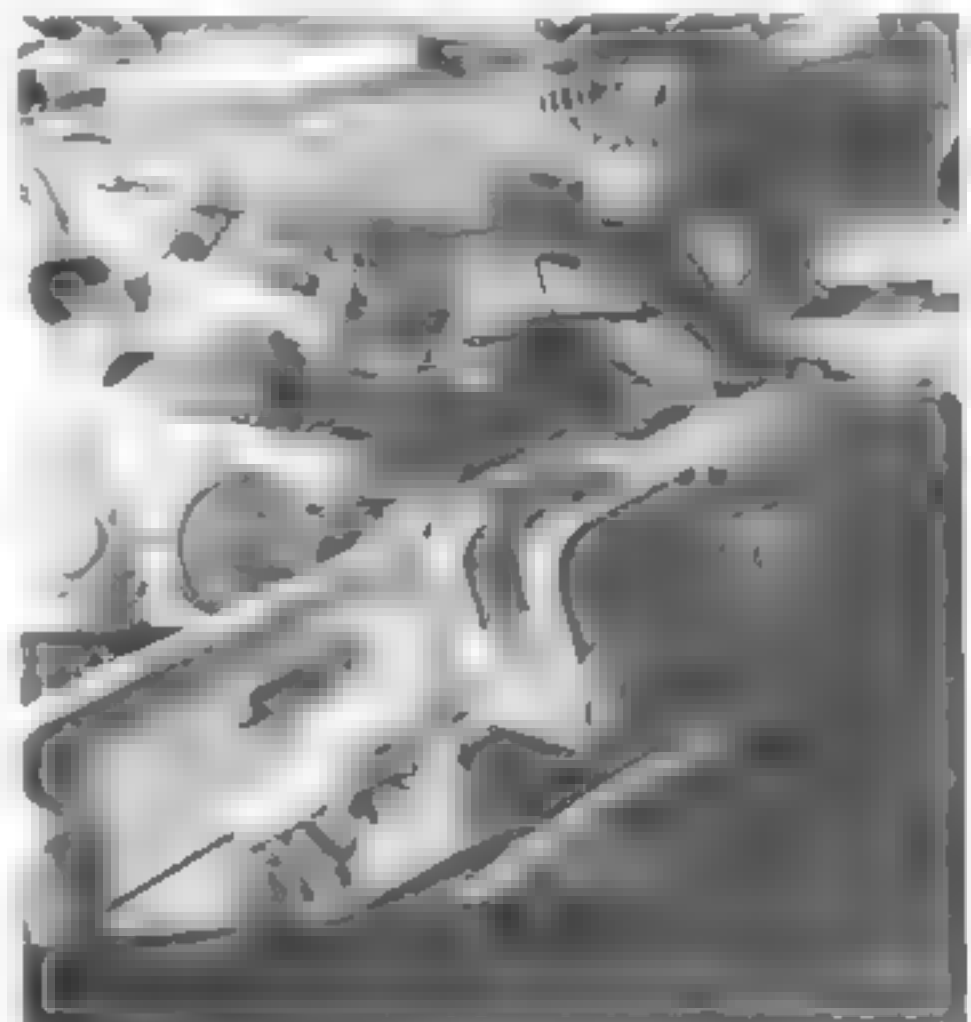


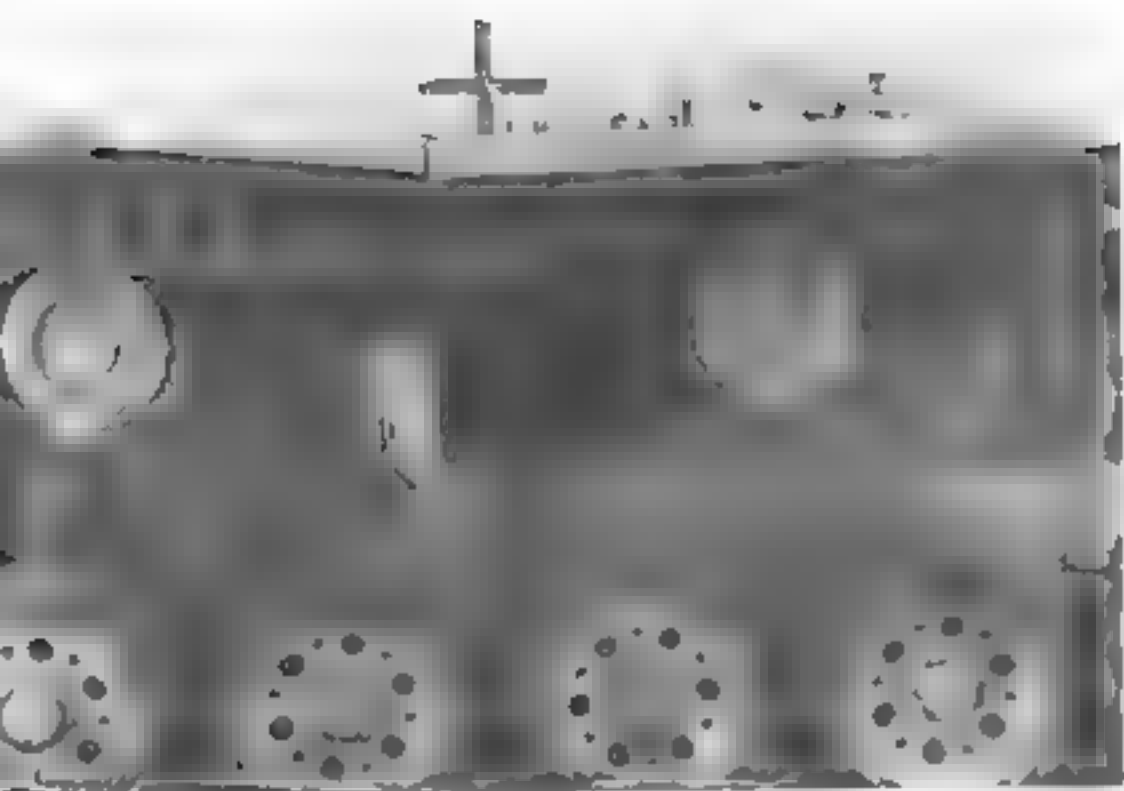
Gunner's seat and sight. Note breech of the 75 mm. gun

geschütz" (assault gun) series. These infantry support vehicles were demanded as soon as it became obvious that the newly-established armoured force was to be used within the framework of strategic warfare. An order, issued on June 15, 1936, awarded Daimler-Benz the contract for the construction of an armoured assault gun. Since they had been instrumental in creating the Panzer III, they also used its chassis components for the new vehicle. It carried the short 75 mm gun in a limited traverse mount and had 50 mm frontal armour. Neither the short 75 mm gun nor the thicker armour were incorporated in the standard Panzer III until 1943. At that time, the Sturmgeschütz already had the long-barrelled 75 mm gun and 80 mm frontal armour.

Thus, a trend was started to create a versatile vehicle which later proved to be invaluable in providing protection for infantry units. They were used in small numbers for the first time during the invasion of France in 1940, when they were designated "Gepanzerte Selbstfahrlafette für Sturmgeschütz 7.5 cm Kanone" (Sd. Kfz. 142). The official Speer report of January 27, 1945, gives the following production figures for Sturmgeschütz vehicles: 1940—184; 1941—550, 1942—828; 1943—3,319; and 1944—7,628. They were still in production when the war ended in 1945.

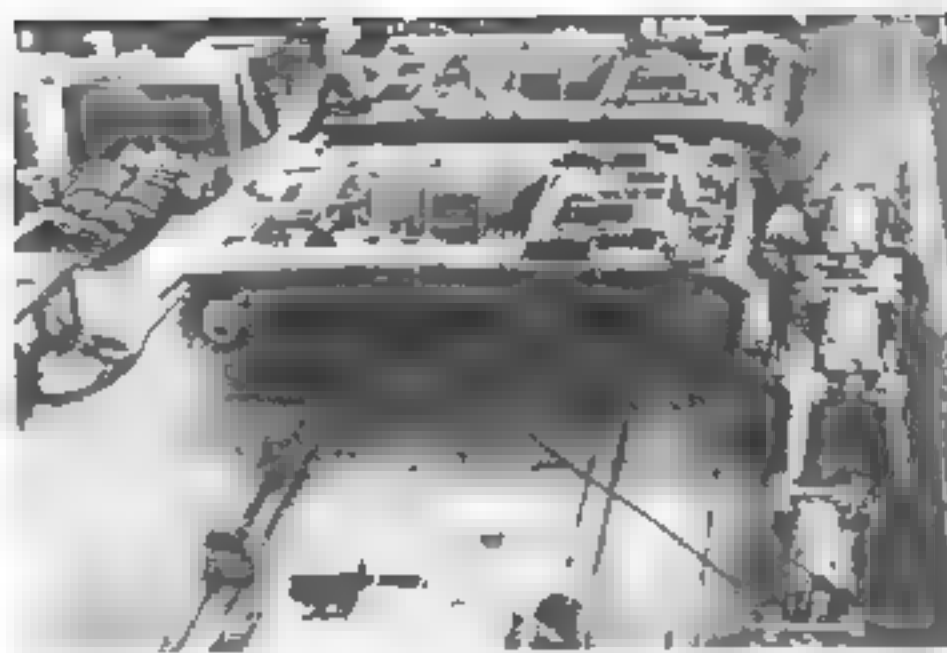
Breech and sight for the 50 mm. gun in the Panzer III Ausf. I. Note the voice tube (upper left) from the commander's position in the cupola. (Imp. War Mus.)





Close view of the Panzer III suspension, showing the side escape hatch from the fighting compartment (Imp. War Mus.)

years, both in Africa and Russia. Up to 1942 no tank battle was fought anywhere in the European theatre of war without the Panzer III taking an important and mostly decisive part. It was not the fault of the vehicle, nor can it be attributed to its crews, if short-sightedness and complacency delayed German tank development to such an extent that the appearance of the Russian T-34 almost overnight rendered the



Panzer IIIs under construction. These are E-G type chassis with the early pattern sprocket and idler wheels. Simple chassis layout is evident from this view. (Imp. War Mus.)

German tank force useless. This spelled doom for the Panzer III, which after 1943 was quickly phased out of front line service and its production capacity given over to more powerful vehicles. The necessity to protect infantry units against ever-increasing numbers of enemy tanks had hastened this decision, since both the long 5 cm and the short-barrelled 7.5 cm tank guns, the only weapons the Panzer III could carry, proved to be inadequate. The Panzer IV, with the 7.5 cm KwK 40 L/48, soon became the main arma-

Interior of the Panzer III, showing the turret and the main gun. The turret is mounted on a movable twin covers over vision ports in cupola. (Imp. War Mus.)





Above: The Krupp prototype for the ZW requirement. This vehicle was not adopted as the basis of the Panzer III but Krupp incorporated many of its features in the Panzer IV later. (Imp. War Mus.)



The Panzer III Ausf B differed from the A in having eight small bogie wheels. Note in particular the plain "dustbin" type cupola with eight peep slots and the horn type periscope on the turret top. Model C was externally identical. (Imp. War Mus.)



Above: Panzer III Ausf D retained the small bogie wheels but had further modifications to the suspension, including large leaf-springs. This model was the first Panzer III with a cupola that incorporated shutters over the now only five vision ports. (Imp. War Mus.)



ment of the German tank regiments. The technical soundness of the Panzer III chassis, however, kept it in production for the StuG III role until the end of the war. The fact that a grand total of 15,350 "ZW" chassis was produced between 1935 and 1945 speaks for itself as an indication of its reliability and usefulness.

The Panzer III, without a doubt, wrote its own chapter in armoured warfare and dominated, like no other armoured vehicle, the tank battles of the early war years. It also helped to start a new trend in the construction of armoured fighting vehicles. Not least of its influences was its effect on future design in British and U.S. tanks. Prior to the appearance of the Panzer III and IV neither British nor U.S. tanks had been designed with much thought to standardization or to development potential. The Panzer III showed how a basic chassis could be progressively up-gunned, up-armoured, and used for several special purpose variants; contemporary British and U.S. tanks fell behind the Panzer III in all these respects, one of the reasons for German tank superiority in the Western Desert fighting. Ironically enough the Panzer III and its excellent fighting reputation in the early war years was one of the factors which led to the development of such medium tanks as the Shermans and Cromwells with which the Allies turned the tide of tank warfare in their favour in 1944-45. For this influence on tank development in World War 2, the Panzer III wins an important place in the history of the A.F.V.

A.F.V. Series Editor: DUNCAN CROW

Left: Excellent top view of a Panzer III Ausf E or F shows clearly the distinguishing features of the early models, including 37 mm. gun with internal mantlet, and flush fitting engine covers without raised louvres. Note also the early type of bow machine gun mount, and the hatches in the glacis plate for access to the drive mechanism which were also used as escape hatches. (Axel Duckert.)



Panzer III Ausf J with long 50 mm. gun, shown in Russia in 1942 with winter camouflage and trackshoes on nose and turret top for added protection. (Warpics.)

SPECIFICATION: PANZERKAMPFWAGEN III AUSFÜHRUNG F (TYPE 5/ZW)

General

Crew: Five—commander, gunner, loader, driver, radio operator.
Battle weight: 19.5 metric tons.
Dry weight: 18 metric tons.
Ground pressure: 0.99 Kg/cm².

Dimensions

Length overall: 5,380 mm.
Height: 2,435 mm.
Width: 2,910 mm.
Track centres: 360 mm.
Ground clearance: 385 mm.

Armament

Originally, one 3.7 cm KwK L/45, later up-gunned to 5 cm KwK 39 L/42.
One MG 34 7.92 mm, mounted co-axially.
One MG 34 7.92 mm, mounted in hull front, right.

Fire Control

Turret traverse, 360°, by hand wheel, elevation by hand 10°, depression 10°. Electric primer operated by trigger. Co-axial MG fired by rod and pedal from gunner's right foot. Hull MG fired by trigger.

Ammunition

3.7 cm KwK: 120 rds, mixed HE and APC.
5 cm KwK: 99 rds, mixed.
7.92 mm: 3,750 rds.

Sighting and Vision

Main armament: 1 TZFa, vorl. 5 cm telescope.
Hull machine gun: 1 telescope.
Commander: 5 vision slots in cupola.
Gunner: 1 vision slit each in turret front and side.
Loader: 1 vision slit each in turret front and side.
Hull gunner/RO: 1 vision slit on right hand hull side.
Driver: Fahrerblende 30 and vision slit on left hand hull side.

Communications

W/T Set (2 receivers, 1 transmitter) L/T Set.

Armour

Machinable quality armour plate, austenitic welded.
Hull: nose 30 mm/20°, vertical front plate 30 mm/9°. Lower sides 30 mm/90°, upper sides 30 mm/90°. Top 17 mm/horizontal, bottom 16 mm horizontal.
Turret: mantlet 30 mm/curved, front 30 mm/15°. Sides 30 mm/25°.

rear 30 mm/12°, roof 12 mm. Some series with 30 mm spaced armour on front portions of hull and superstructure.

Engine

Maybach HL 120 TRM: petrol.
12 cylinders, 60° "V", water cooled.
Capacity 11,867 cc.
300 bhp at 3,000 r.p.m.
Fuel: 320 litres in one tank in engine compartment.

Transmission

Maybach "SRG 328145" Variorex pre-selector.
Type: 10 forward speeds, 1 reverse (4 possible).
Final drive ratio: 4:1.
Steering: Daimler-Benz/Wilson clutch brake, hydraulically assisted.

Suspension

Six independently sprung rubber-tyred road wheels (size, 520 x 95—398) per side, mounted on transverse torsion bars. Torsion bars are staggered approximately 5 in.
Three return rollers per side (size 310 x 70—203).
Track: Cast manganese steel, skeleton type. Width: 260 mm, pitch 120 mm, 93 links per track.

Electrical System

One 12 V generator.
Two 12 V batteries.
One 4 hp starter motor.

Performance

Maximum road speed: 40 Km/h.
Maximum gradient: 30°.
Trench crossing: 2,300 mm.
Wading depth: 800 mm.
Range: Road 165 km/cross country 95 Km.
Fuel consumption: 187 litres/100 Km.

Conversion Table

1 millimetre	= 0.0394 in.
1 centimetre	= 0.3937 in.
1 metre	= 39.3708 in. (approx. 3 ft. 3 in.).
1 kilometre (Km)	= 0.6214 mile. (8 Km = 5 miles approx.).
1 litre	= 1.76 pints.
50 litres	= 11 gallons.
1 kilogram (Kg)	= 2.2046 pounds.
1 metric ton	= 2,204.6 pounds.
1 ton	= 2,240 pounds.



Above: A Panzer III Ausf D pictured in Norway in April 1940 at the time of the German occupation. Note crew in berets, discarded after 1940.

Below: A fine view of one of the Panzer III Ausf A development vehicles on test, showing the large bogie wheels used in this first model. (Chamberlain Collection.)



AFV

The new **Profile Publications AFV Series** of books on the Armoured Fighting Vehicles of the World, will continue the pattern established by the twenty-four issues of *Armour in Profile*. But there will be a big difference—in presentation, format, size and cost.

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